UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/399,678	09/21/1999	DUANE L. ABBEY	98CR023/KE	2540

7590 06/15/2004

ATTENTION: KYLE EPPELE
ROCKWELL COLLINS INC
400 COLLINS RD NE
CEDAR RAPIDS, IA 52498

EXAMINER	
MUNOZ, GUILLERMO	
ART UNIT	**PAPER NUMBER**
2634	9

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/399,678	ABBEY, DUANE L.
	Examiner	Art Unit
	Guillermo Munoz	2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *13-25* is/are allowed.

6)☒ Claim(s) *1-12,26 and 29-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Argument

Applicant's arguments, see pages 11-12, filed March 29, 2004, with respect to the rejection(s)of claim(s) 1-3, 6-8, 13, 14, 16 and 20 under 35 U.S.C. 102(e) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made to claims 1-12, 26, and 29-34.

Claim Rejections - 35 USC § 112 Second Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1-12, 26, 32 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1; the phrase "cascaded comb structure comprises a plurality of comb stages" in claim 8, line 3 further limits the cascaded comb structure of claim 1 to one having two or more stages, for this reason, the phrase "cascaded comb structure" in claim 1, line 4 encompass cascaded comb structures having a single comb stage.

Therefore, the phrase "located with said cascaded comb structure" in lines 7 and 9 is critical or essential to the practice of the invention, but not defined in the claim(s) and is not enabled by the disclosure. The phrase "located with" render three possible interpretations of the claimed cascaded integrator comb digital filter structure: one, the second rate change and resonator components may be located before the single comb stage; two, the second rate change

and resonator components may be integrated into the single comb stage; three, the second rate change and resonator components may be located after the single comb stage.

It is suggested the phrase "located with said cascaded comb structure" in claim 1, line 7 and 9 be amended to reflect the structure of Figure 7, elements 720, 724, 722, and 730.

Regarding claim 26, the phrase "located with said cascaded comb means" in lines 7 and 8 render the claim indefinite for the reasons applied to claim 1 above.

Regarding claim 32, the phrase "located with said cascaded comb structure" in line 7 render the claim indefinite for the reasons applied to claim 1 above.

Regarding claim 34, the phrase "located with said means for providing a cascaded comb function" in lines 7 and 9 render the claim indefinite for the reasons applied to claim 1 above.

Claims 2-12 and 29-30 are dependent on rejected claim 1 and 26, respectively, and are rejected under 35 U.S.C. 112, second paragraph.

Claim Rejections - 35 USC § 112 First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. § 112, first paragraph, as failing to provide an adequate written description of the invention.

Applicant discloses "Figure 14 depicts a parallel processed, pre-decimate by four...functionally equivalent to the filter section of Figure 13" (page 18, lines 13-15). Applicant further discloses "The structure of Figure 14 could replace the integrator stages 702,

704, 706, 708 and the rate change component 710 of the tailored response CIC digital filter of Figure 7" (page 19, lines 1-3).

It is clear that the rate change element 1412 of Figure 14 would replace the rate change element 710 of figure 7. Furthermore, it is clear that the second rate change element 722 would remain unchanged. Thus the tailored response CIC of figure 14 would have a first rate change element 1412 and a second rate change element 722. It can be concluded from the preceding disclosures that two rate change elements are involved in both embodiments disclosed in the instant application.

Claims 4, 5, and 31 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. 7.6.

In regards to claim 4, the phrase "third rate change component" in line 2 is not described in the specification or figures of the instant application.

In regards to claim 5, the phrase "additional rate change components" are not described in the specification or figures of the instant application.

In regards to claim 31, the phrase "a third rate change component" in line 7 is not described in the specification or figures of the instant application.

Claims 1-12, 26, 29, 30, 32 and 34 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a cascade comb structure having a plurality of comb stages, does not reasonably provide enablement for a cascade comb structure having a

single comb stage. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

Regarding claim 1; the phrase "cascaded comb structure comprises a plurality of comb stages" in claim 8, line 3 further limits the cascaded comb structure of claim 1 to one having two or more stages, for this reason, the phrase "cascaded comb structure" in claim 1, line 4 encompass cascaded comb structures having a single comb stage.

The instant application provides no instruction to placing a second rate converter and resonator component before, after, or within a cascaded comb structure having a single comb stage. The invention of the instant application is directed towards a cascaded comb structure having at least two comb stages having a resonator and a second rate converter component located between two comb stages.

Therefore, the phrase "located with said cascaded comb structure" in lines 7 and 9 is not enabled by the disclosure.

Regarding claim 26, the phrase "located with said cascaded comb means" in lines 7 and 8 is not enabled by the specification for the reasons applied to claim 1 above.

Regarding claim 32, the phrase "located with said cascaded comb structure" in line 7 is not enabled by the specification for the reasons applied to claim 1 above.

Regarding claim 34, the phrase "located with said means for providing a cascaded comb function" in lines 7 and 9 is not enabled by the specification for the reasons applied to claim 1 above.

Claims 2-12, and 29-30 are dependent on rejected claim 1 and 26, respectively, and are rejected under 35 U.S.C. 112, first paragraph.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. (cited in Office Action mailed July 22, 2003) in view of Gao et al. (cited in Office Action mailed July 22, 2003).

In regards to claim 33, Yang teaches a polyphase CIC filter wherein:

- "Instead of using one CIC filter to decimate the high speed digital signal, here we use two (one N_1-stage and one N_2-stage). The downconversion factors for them are R_1 and R_2, respectively. Here we assume that R can be factored as $R_1 * R_2$"(page 230, col.3).
- "Where $F_i(z)$ are polyphase components, operating at the rate of f_s/R_1. Thus the polyphase structure for CIC decimation filters can be built as shown in Fig. 2"(page 230, col.4, Fig.2).
- "Since there are finite combinations for the polyphase components' output, a look-up table ROM can be used to store all the possible results which will be addressed by bandpass $\Delta\Sigma$ modulator's outputs "(page 231, col.5).

Yang teaches that the polyphase components $F_i(z)$ operate at a downconverted rate f_s/R_1. R_1 is equivalent to claimed data rate change component establishing the data rate input to the integrator structure. Yang, also, teaches that $R=R_1*R_2$. Yang, however, fails to teach that the CIC decimator filter outputs data equivalent to a post-decimated integrator filter.

Gao et al teaches a partial polyphase CIC decimator filter wherein:

- "filters can operate at much lower sampling rate meanwhile achieve the same performance as Hogenauer's CIC filters"(page 392, col.3).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to downconvert the sample rate f_s of Yang prior to input into the integrator stage in view of Gao for the purpose of operating at a lower sampling rate.

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance:

Claims 13-25 are considered allowable because the present invention comprises a pre-decimated integrator filter comprising first data rate change component supplying data to a first integrator structure comprising at least one recursive integrator stage. The closes prior art, Yang et al. (cited in Office Action mailed July 22, 2003) shows a similar circuit including a first data rate change component supplying data to a first integrator structure. However, Yang et al. fails to teach a first integrator structure comprising at least one recursive integrator stage. This distinct feature has been included in independent claims 13 and 25 rendering them allowable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Guillermo Munoz whose telephone number is 703-305-4224. The examiner can normally be reached on Monday-Friday 8:30a.m-4:30p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Guillermo Munoz

GM
June 7, 2004

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600